

The Impact of Sudden Changes in Title I Funding on Ohio School Districts



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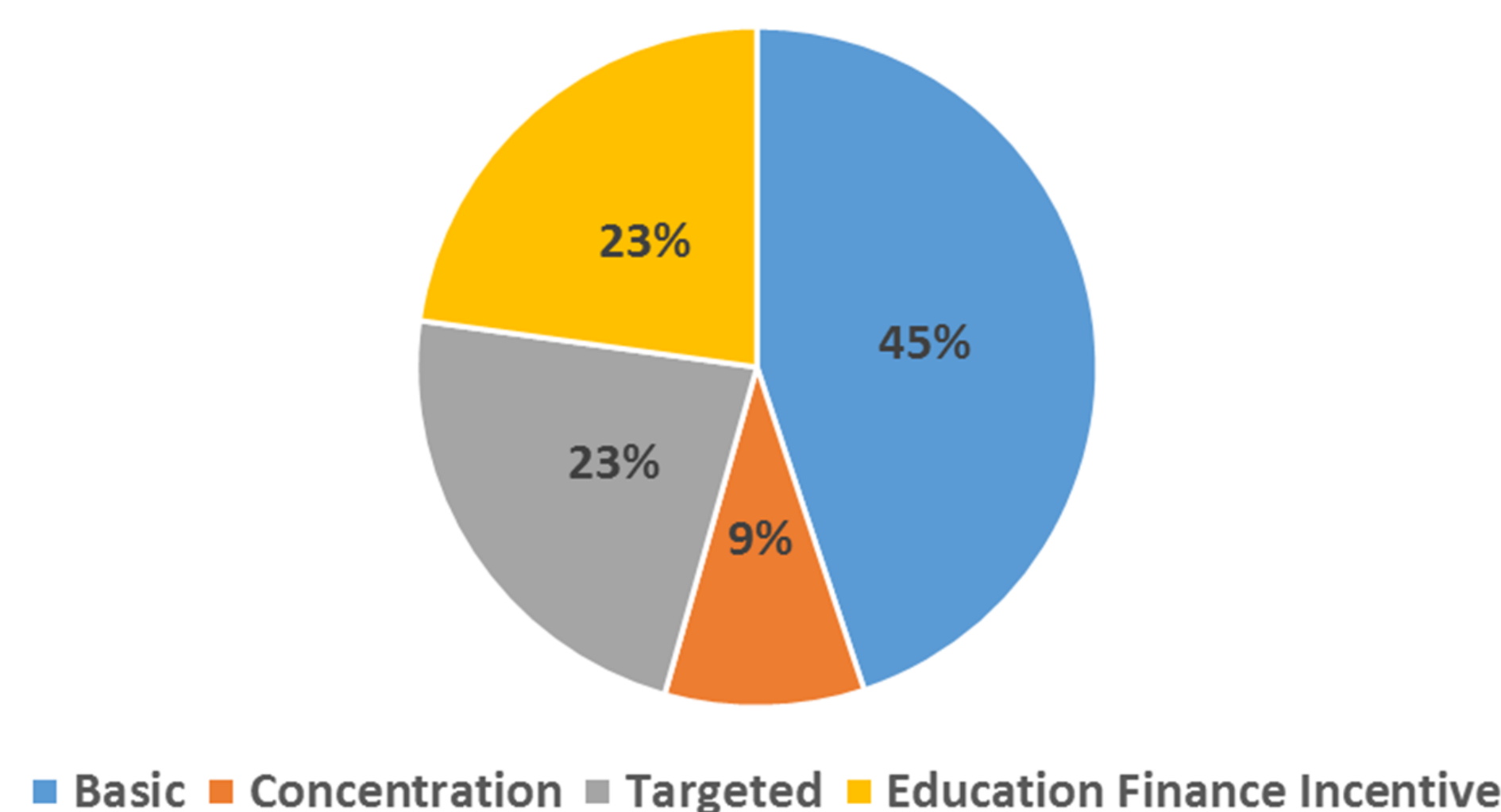
Abstract

The federal Title I program is now the largest federal education finance program aimed at improving the achievement of low-income students, yet the impact of this funding on disadvantaged students is still heavily debated. Determining the causal effect of Title I funding on district spending and student learning is difficult because the poverty counts used to calculate allocations are also correlated with these outcomes. Using data from Ohio, I exploit changes in federal student poverty counts due to the 2010 Census, which are unrelated to actual changes in district poverty levels during that same time period. These changes led to significant changes in Title I allocations across districts. I find that sudden changes in Title I allocations increase total, state, and federal revenue initially, but in the long-run a local offsetting response subsequently results in a negative effect for instructional expenditures. The results suggest that Title I has little to no effect on student achievement.

Background

Title I includes four allocation formulas, with the distribution of funding among these four grants shown in the chart below.

Share of Title I Appropriations by Formula Grant Type, FY 2014



Source: New America Education Program (2015), *NCLB Title I Distribution Formulas*

In my study, I attempt to assess whether lower levels of government supplant their funds in response to the receipt of quasi-random Title I funds and to determine the subsequent impact of these shifts in funds on several outcomes of interest. The finding of a local offsetting effect would challenge existing evidence on the “flypaper effect”, which suggests that funds “stick” to the purpose for which they are intended and increase net revenues.

Objectives

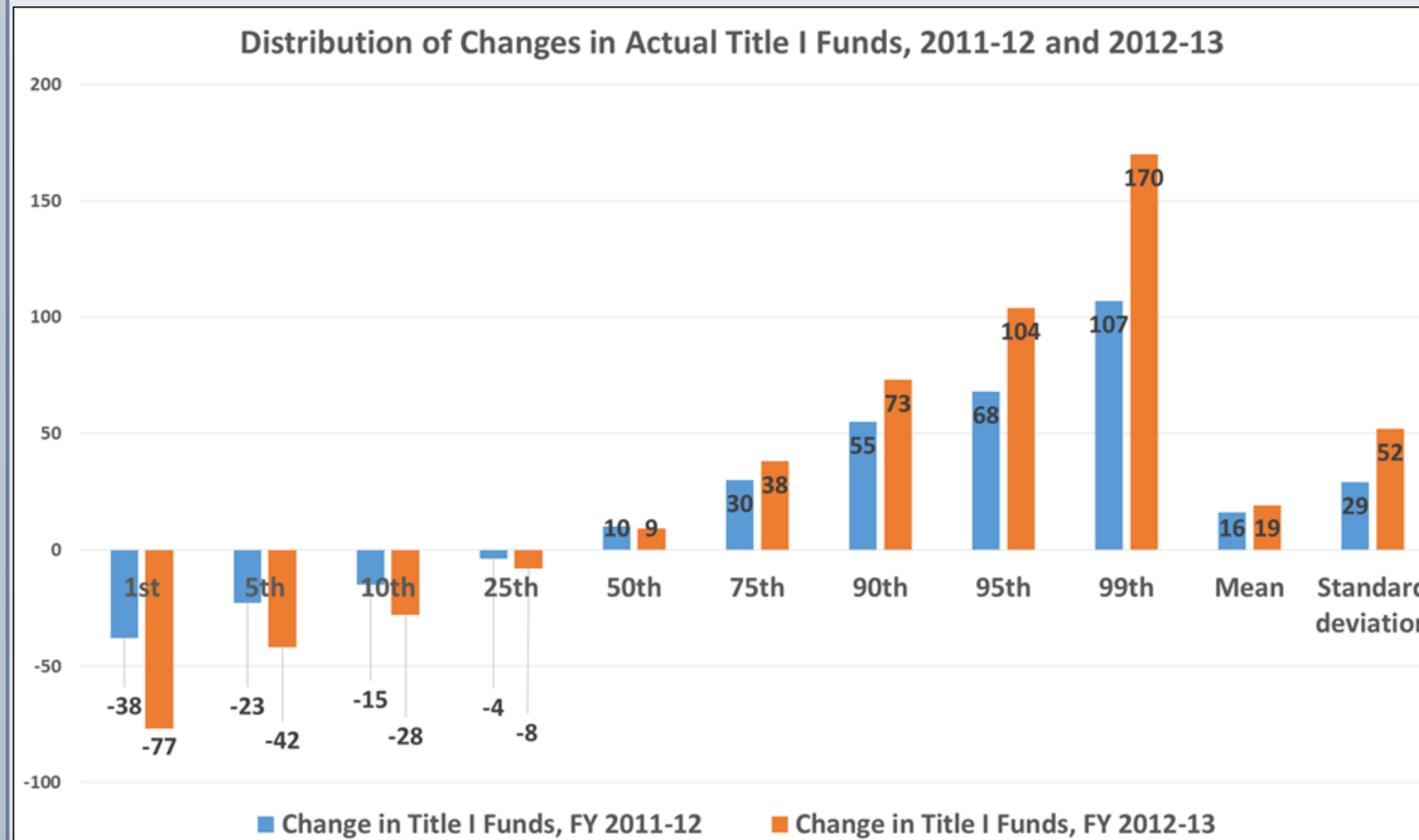
1. Exploit quasi-experimental variation to estimate the causal effect of federal funding on:
 - Revenue and expenditure patterns
 - Student performance
2. Test the validity of the assumption that funding shocks are quasi-random
3. Probe robustness of results to a variety of methods of analysis

Methods

I utilized a two-stage least-squares (2SLS) instrumental variables (IV) design to estimate the impact of quasi-random changes in Title I funding. Sudden shifts in poverty counts generated by decennial updating of the U.S. Census subsequently drive quasi-random changes in Title I funding. Title I allocations changed discretely when new Census poverty data was first used in FY 2013, while state and local revenues that depend on poverty changed continuously.

The graph below shows:

- Actual changes in Title I funding were greater in 2012-2013
- The disparity in funding changes is greatest at the tails of the distribution
- These changes in funds driven by Census-updating provide the variation needed for the IV method



Note: the changes in Title I funds are in dollar amounts and the distribution ranges from the 1st to the 99th percentile.

First-stage model:

$$(1) \Delta \text{ActualTitleI}_{dt} = \beta_0 + \beta_1 \Delta \text{ExogTitleI}_{dt} + \mu_{dt}$$

- $\Delta \text{ActualTitleI}_{dt}$ is the actual change in Title I funds
- $\Delta \text{ExogTitleI}_{dt}$ is the calculated Census-related change in Title I funding
- μ_{dt} is the random error term

Second-stage model:

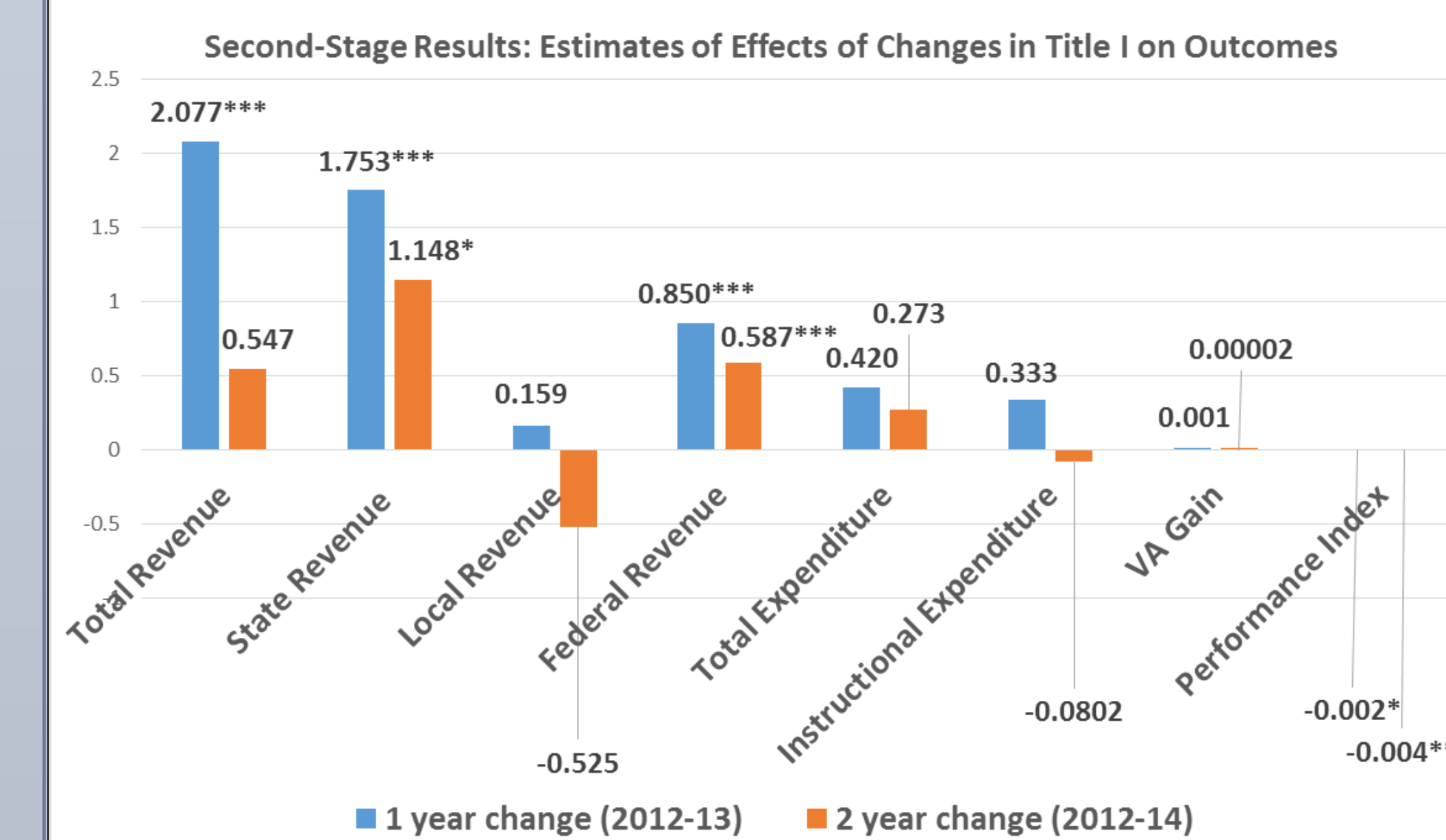
$$(2) \Delta Y_{dt} = \beta_0 + \beta_1 \Delta \text{ActualTitleI}_{dt} + \beta_2 \text{lag} \Delta \text{State Revenue}_{dt-1} + \beta_3 \text{lag} \Delta \text{State Revenue}_{dt-2} + \beta_4 \text{lag} \Delta \text{Local Revenue}_{dt-1} + \beta_5 \text{lag} \Delta \text{Local Revenue}_{dt-2} + \mu_{dt}$$

- ΔY_{dt} is the change in outcome (e.g. revenues and achievement)
- $\Delta \text{ActualTitleI}_{dt}$ is the change in funding predicted by the first-stage result
- Model includes controls for lagged changes in revenue per pupil

Results

Table 1: First-Stage Results: Correlation Between Calculated and Actual Changes in Title I Funds Per Pupil

Dependent variable	Independent variable	Coefficient (S.E.)	F	R ²
Actual change in Title I per pupil, FY 12-13	Simulated change in Title I per pupil, FY 12-13	1.190*** (.042)	814.29	0.5729
Actual change in Title I per pupil, FY 12-14	Simulated change in Title I per pupil, FY 12-14	1.393*** (.050)	793.73	0.5667



Census-related changes in Title I funding lead to:

1. Significant increases in revenues in 2013

- A \$1 increase in Title I funding is associated with a \$2.08 increase in total revenue, \$1.75 increase in state revenue, \$0.85 increase in federal revenue, and a slight positive increase in local revenue

2. Small and insignificant increases in total and instructional expenditures in 2013

3. Insignificant decreases in local revenue and instructional expenditures in 2014, while the positive effect for other revenue and expenditure variables is reduced compared to the 2013 estimates

- A \$1 increase in Title I funding is associated with a \$0.53 decrease in local revenue and \$0.08 decrease in instructional expenditures

4. A significant and slightly negative effect on the performance index in both 2013 and 2014

Conclusions

- **Evidence of the flypaper effect and an offsetting response:** For the 1 year change, revenues and expenditures increase, confirming the flypaper effect. However, over time, the positive effects for revenue are reduced and there is a negative local offsetting response that has adverse impacts on instructional spending and student achievement.
- **Data issues and simultaneous changes in the state funding formula may complicate results:** Curiously, increases in Title I are associated with large positive changes in total and state revenue. A change in how the total revenue variable is measured may partially account for this result in 2013. The large positive effect for state revenue may reflect a legislative change in the same time period that altered Ohio’s school funding formula.
- **Lack of evidence of increased service delivery:** For the 2 year change, Title I has a negative and insignificant impact on instructional spending, so it seems unlikely Title I yields greater service delivery for low-income students. This failure to increase net services may partially explain why Title I does not have a substantial or significant impact on student achievement.
- **Limited impact on student performance:** The achievement results reveal that Title I did not improve student performance, which raises the question of whether the most effective interventions are being used with the flexible use of Title I funds.

Suggestions for Further Research

- Explore how changes in Title I funds affect these outcomes over a longer period of time
- Perform within-district analysis to determine school-level impact

References and Acknowledgements

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Sonnenberg, W., & Provasnik, S. (2007). *Allocating Grants for Title I*. National Center for Education Statistics.

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